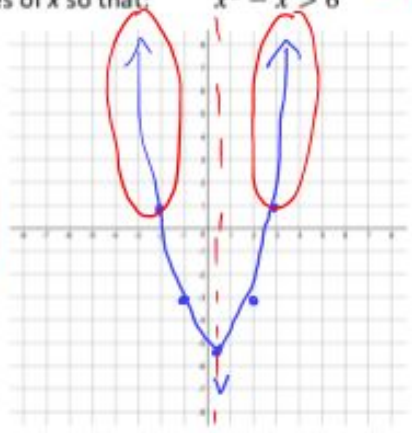
Homework: Section 4.4 on Pg. 138 ; #2-3all
Section 4.5 on Pg. 142; #2-4, 7-15

Ex 1 Find all values of x so that: $x^2 - x > 6$

a) using a graph



$x > 3$

$x < -2$

b) using algebra

$x^2 - x > 6$

$\Rightarrow x^2 - x - 6 > 0$ ← look for x-ints (transitions from ⊕ to ⊖)

$\Rightarrow x^2 - x - 6 > 0$

let $y = x^2 - x - 6$

$y > 0$ ← For what x is $y > 0$

$h = \frac{-(-1)}{2(1)} = \frac{1}{2} = 0.5$

$k = (0.5)^2 - (0.5) - 6 = -6.25$

$x = 2 \Rightarrow y = (2)^2 - (2) - 6 = 4 - 2 - 6 = -4$

$x = 3 \Rightarrow y = (3)^2 - 3 - 6 = 0$

⊗ -6 $(-3,2)$

⊕ -1 -1

$(x-3)(x+2) > 0$

x-ints: $x = 3, -2$

test: ① $\Rightarrow x = -3 \Rightarrow (-3)^2 - (-3) - 6 = 6$

② $\Rightarrow x = 0 \Rightarrow (0)^2 - (0) - 6 = -6$

③ $\Rightarrow x = 4 \Rightarrow 4^2 - 4 - 6 = 6$

$x < -2$

$x > 3$

Ex 2 Find all values of x so that: $-2x^2 \geq 12 - 5x$

$\Rightarrow 0 \geq 2x^2 - 5x + 12$

$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(2)(12)}}{2(2)}$

$= \frac{5 \pm \sqrt{25 - 96}}{4} = \frac{5 \pm \sqrt{-71}}{4}$ = no answer, no x-ints

NO x-int test any pt

$x = 0 \Rightarrow 2(0)^2 - 5(0) + 12 = 12$

No x values work ⇒ no Solution

Ex 3 The height of a ball above the ground (H, in metres) thrown from a building after t seconds is given by: $H(t) = -4.9t^2 + 15.8t + 22.8$. When is the ball at most 30m above the ground?

$-4.9t^2 + 15.8t + 22.8 \leq 30$

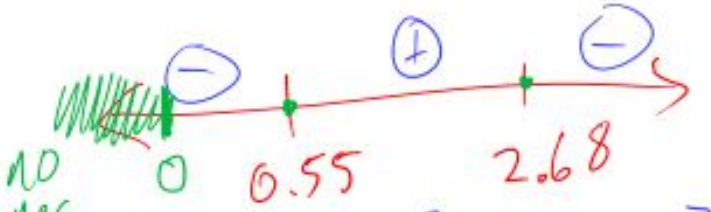
$-4.9t^2 + 15.8t - 7.2 \leq 0$

$t = \dfrac{-15.8 \pm \sqrt{(15.8)^2 - 4(-4.9)(-7.2)}}{2(-4.9)}$

$t = 0.55, 2.68$

$0 \leq t \leq 0.55$

$t \geq 2.68$



$t=0 \Rightarrow -4.9(0)^2 + 15.8(0) - 7.2 = -7.2$

$t=1 \Rightarrow -4.9(1)^2 + 15.8(1) - 7.2 = 3.7$

$t=3 \Rightarrow -4.9(3)^2 + 15.8(3) - 7.2 = -3.9$

Ex 4 Mr. G is buying green and blue highlighters for marking. The green highlighters cost $2.50 and the blue highlighters cost $2.25. He wants to buy at least 15 highlighters but needs at least 8 green highlighters. He can't spend more than $50. Write a system of inequalities to describe the situation.

x = # Green highlighters

y = # Blue highlighters

Money ≤ 50

Buy at least 15 $\Rightarrow$ $x + y \geq 15$

at least 8 green $\Rightarrow$ $x \geq 8$

Can't spend more than $50 $\Rightarrow$ $2.50x + 2.25y \leq 50$